

Amendments to the Specification:

IN THE ABSTRACT:

Please replace the Abstract filed with the amended Abstract as attached.

IN THE SPECIFICATION:

Please replace the paragraph at page 1, lines 10-23 with the following rewritten paragraph:

An exhaust emission control system for ~~purging~~ purifying NOx from an exhaust gas discharged from an internal combustion engine capable of performing a lean combustion involves the use of, e.g., a NOx absorbent typified by an occlusion reducing type NOx catalyst. The NOx absorbent absorbs NOx when an air-fuel ratio of an inflow exhaust gas is lean (i.e., under an over oxygen atmosphere), and releases absorbed NOx when an oxygen concentration of the inflow exhaust gas decreases. The occlusion reducing type NOx catalyst classified as one type of this NOx absorbent absorbs NOx when the air-fuel ratio of the inflow exhaust gas is lean (i.e., under the over oxygen atmosphere), and releases absorbed NOx when the oxygen concentration of the inflow exhaust gas decreases, thus reducing it into N₂.

Please replace the paragraph at page 4, lines 5-18 with the following rewritten paragraph:

To accomplish the above object, according to one aspect of the present invention, an exhaust emission control system of an internal combustion engine, comprises an internal combustion engine, and an exhaust gas purifying catalyst provided in an exhaust passageway of the internal combustion engine. The emission control system further includes a box body formed with an exhaust gas inlet and an exhaust gas outlet, a catalyst support incorporated into the box body, and a catalyst substance supported on the catalyst support, wherein a part of the catalyst support of the exhaust gas ~~purging~~ purifying catalyst is a low resistance area formed so that a gas flow resistance is lower than in other areas and disposed in such a position that a flow velocity of the exhaust gas flowing to the catalyst support is high.

Please replace the paragraph at page 4, line 19 – page 5, line 5 with the following rewritten paragraph:

The gas flow resistance decreases in the low resistance area provided in the catalyst support of the exhaust gas ~~purging~~ purifying catalyst, and therefore the exhaust gas is easier to flow in this area, whereby a flow velocity of the exhaust gas can be increased. Hence, an exhaust gas flow quantity per predetermined time in the low resistance area increase, and a

heat transfer quantity from the exhaust gas to the catalyst can be augmented in the low resistance area. Then, a heat spot is produced in this low resistance area and rises in its temperature faster than in other areas, whereby the heat spot turns out to be a latent flame and a temperature rising region spreads in the periphery. With this contrivance, a temperature rising time of the whole catalyst becomes faster than in a case where the exhaust gas uniformly flows in.

Please replace the paragraph at page 6, lines 13-18 with the following rewritten paragraph:

Thus, the high density support area for supporting the greater quantity of catalyst substance than in other areas, is formed, whereby burning of HC contained in the exhaust gas is accelerated in that area and the temperature increases much faster. Therefore, a function as the latent flame becomes more effective.

Please replace the paragraph at page 6, lines 25-26 with the following rewritten paragraph:

With respect to the exhaust gas-~~purging~~ purifying catalyst, alumina may be exemplified as the catalyst support.

Please replace the paragraph at page 7, lines 6-14 with the following rewritten paragraph:

Note that a plurality of notched portions may also be provided. For instance, the plurality of notched portions is provided in dispersion in the exhaust gas inflow surface of the catalyst. In this case, it is preferable that an aperture-~~area~~ size for one notched portion be set smaller than in the case of providing one single notched portion. With this contrivance, there is a plurality of portions where the temperature rapidly rises, whereby the so-called latent flames occur at multi points and heating spreads fast on the whole.

Please replace the paragraph at page 7, line 25 – page 8, line 4 with the following rewritten paragraph:

It is preferable that the exhaust gas-~~purging~~ purifying catalyst according to the present invention be disposed in the position that is as close to the exhaust port of the internal combustion engine as possible. For instance, the exhaust gas-~~purging~~ purifying catalyst is disposed posterior to an exhaust manifold, and the present invention is, it is preferable, applied as a structure of the start catalyst existing in that position.

Please replace the paragraph at page 8, lines 5-10 with the following rewritten paragraph:

Note that when the notched portion described above is provided, a loss of pressure of the exhaust gas passing through the catalyst decreases, and it can be expected that an exhaust gas ~~purging~~ purifying performance be enhanced due to the reduction in the entire pressure loss of the catalyst itself.

Please replace the paragraph at page 8, line 12 – page 9, line 7 with the following rewritten paragraph:

FIG. 1 is a diagram schematically showing a configuration of an exhaust emission control system of an internal combustion engine according to the present invention;

FIG. 2 is a diagram showing one example of a map of a basic fuel injection time;

FIG. 3 is a diagram schematically showing concentrations of oxygen, unburned HC, CO contained in an exhaust gas discharged from the internal combustion engine;

FIG. 4 is a diagram showing one example of a catalyst support provided with a notched portion;

FIG. 5 is a diagram showing another example of the catalyst provided with a notched portion;

FIG. 6 is a diagram showing still another example of the catalyst support provided with the notched portion;

FIG. 7 is a diagram showing a result of a test for improving a flow velocity when provided with the notched portion;

FIG. 8 is a diagram showing a result of a test for improving an HC ~~purging~~ purifying rate and a warm-up characteristic when provided with the notched portion;

FIG. 9 is a diagram showing an example where a plurality of notched portions are provided; and

FIG. 10 is a diagram showing an example where the notched portion is formed in an annular shape.

Please replace the paragraph at page 10, lines 1-7 with the following rewritten paragraph:

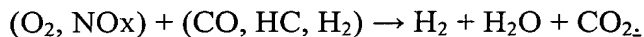
On the other hand, the exhaust port 8 is connected to a casing 18 encasing a three-way catalyst converter 17 that is a so-called start catalyst through an exhaust manifold 16. An outlet of the casing 18 is connected to a casing 21 encasing an occlusion reducing type NOx catalyst 20 through an exhaust pipe 19. This casing 21 is connected to an unillustrated silencer via an exhaust pipe 22.

Please replace the paragraph at page 11, lines 2-8 with the following rewritten paragraph:

On the other hand, the exhaust pipe 19 disposed downstream of the three-way catalyst converter 17 is fitted with a temperature sensor 23 for generating an output voltage proportional to a temperature of an exhaust gas passing through the three-way catalyst converter 17. An output voltage of this temperature sensor 23 is inputted to the input port via the AD converter 38.

Please replace the paragraph at page 13, lines 12-22 with the following rewritten paragraph:

A structure of the three-way catalyst converter 17 is that a honeycomb- or lattice-like cell 51 composed of corgruited-series and ferrite-series stainless steel is of a monolith type in which the cell 51 is coated with alumina, and a catalyst substance having catalyst action on alumina is adhered to the cell 51. Alumina supports a precious metal such as platinum (Pt) + rhodium (Rh), and platinum (Pt) + rhodium (Rh) + palladium (Pd) as a catalyst substance. The three-way catalyst converter 17 simultaneously reduces the three components CO, HC and NOx in the exhaust gas by the following reaction:



Please replace the paragraph at page 13, line 27 – page 14, line 6 with the following rewritten paragraph:

The cell 51 has a notched portion 50 formed in an exhaust gas inflow surface thereof. The notched portion 50 exists in a position decentered from the center the cell 51. The exhaust pipe 19 or the exhaust manifold 16 is, however, bent on the upstream side of the exhaust gas flow with respect to the cell 51, and hence the exhaust inflow surface formed with the notched portion 50 faces to the exhaust gas flow having a maximum flow velocity.

Please replace the paragraph at page 14, line 19 – page 15, line 8 with the following rewritten paragraph:

The notched portion 50 takes a recessed configuration of which a diameter is uniform in the example shown in FIG. 4. As shown in FIGS. 5 and 6, however, the notched portion 50 may take configuration that a sectional diameter is gradually ~~such a~~ decreased towards the downstream side of the exhaust gas (which will hereinafter be called a conical shape). The notched portion 53 shown in FIG. 5 exhibits a sharp change in diameter thereof. The notched portion 53 shown in FIG. 6 exhibits a moderate change in diameter thereof. Further, in the example shown in FIG. 5, the exhaust gas flows substantially straight just before the cell 51, and therefore the center of the notched portion 53 that should face to the exhaust gas flow

having the maximum flow velocity is substantially concentric with the center of the cell 51. A depth of each of the notched portions 50, 53 is herein set within a range of $1/10 \sim 2/10$ of the total length of the catalyst cell 51.

Please replace the paragraph at page 16, lines 9-18 with the following rewritten paragraph:

The three-way catalyst converter used herein has such a configuration that the cell 51 takes a circular shape in section, and a diameter thereof is 140 mm. The notched portion 50 is formed substantially at the center of the cell 51. The notched portion 50 is 20 mm in diameter and 30 mm in depth. This notched portion 50 is provided inside the exhaust passageway of the internal combustion engine. A flow velocity of the exhaust gas at a rear end surface from which the exhaust gas passing through within the three-way catalyst converter flows out, is measured along the periphery from the center thereof.

Please replace the paragraph at page 17, lines 17-21 with the following rewritten paragraph:

This catalyst is provided within the exhaust passageway of the internal combustion engine, and the internal combustion engine is operated, thus measuring a quantity of HC contained in the exhaust gas in front and rear of the three-way catalyst converter.

Please replace the paragraph at page 17, line 26 – page 18, line 5 with the following rewritten paragraph:

FIG. 8 shows a result of this measurement. Herein, an HC-~~purging~~ purifying rate in the case of providing the notched portion 50 reaches 90% in approximately 120 sec since the start-up of the internal combustion engine. By contrast, in the case of the cell formed with no notched portion 50, the HC-~~purging~~ purifying rate is low on the whole and does not reach 90% till there is an elapse of 200 sec or longer.

Please replace the paragraph at page 18, lines 6-11 with the following rewritten paragraph:

Accordingly, when provided with the notched portion, the temperature rising speed is faster than in the case of providing no notched portion 50. As a result, it can be understood that the temperature of the catalyst reaches a-~~purging~~ purifying region at an early stage since the start-up of the internal combustion engine, and the HC-~~purging~~ purifying rate is enhanced.

Please replace the paragraph at page 19, line 14 – page 20, line 3 with the following rewritten paragraph:

Further, the fuel contains sulfur (S), and, when sulfur in the fuel is burned, sulfur oxide (SOx) such as SO₂ and SO₃ is produced. The three-way catalyst converter 17 captures SOx contained in the exhaust gas. In this embodiment, a quantity of SOx absorbed by the three-way catalyst converter 17 is estimated based on a hysteresis of the engine operation state. Timing when this estimated ~~Sox~~ SOx absorption quantity comes to a predetermined quantity is judged to be timing when SOx should be released from the SOx absorbent 17. Then, there is executed a process of positively releasing SOx out of the three-way catalyst converter 17 (which will hereinafter be called a reproducing process). When executing the reproducing process of the three-way catalyst converter 17, the ECU 30 controls a temperature of the exhaust gas by use of a proper contrivance, and controls the temperature of the three-way catalyst converter 17 to a predetermined temperature (e.g., 550°C) or higher.

Please replace the paragraph at page 22, lines 8-12 with the following rewritten paragraph:

Thus, when the notched portion 53 is formed in the end surface of the catalyst, the catalyst temperature rising speed is faster than in the case of providing no notched portion 53. Further, when the high-density support area 54 is provided, the temperature rising speed becomes faster.